

**2012 Miniboard Exam**  
**General Pathology Blank**

Candidate # \_\_\_\_\_

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**General Pathology**

1. Which caspase is activated during pyroptosis?
  - a. Caspase 1
  - b. Caspase 3
  - c. Caspase 6
  - d. Caspase 8
  - e. Caspase 9
2. Where is the majority of glutathione degraded?
  - a. Cytoplasm of hepatocytes
  - b. Cytoplasm of renal tubular epithelium
  - c. Brush border of distal convoluted tubules
  - d. Brush border of proximal convoluted tubules
  - e. Mitochondria of renal tubular epithelium
3. Which of the following complement regulatory proteins prevents formation of the membrane attack complex?
  - a. CR1
  - b. CR1g
  - c. DAF
  - d. Factor H
  - e. CD 59
4. Which of the following toll-like receptors does NOT use MyD88 as its primary signaling molecule?
  - a. TLR1
  - b. TLR2
  - c. TLR3
  - d. TLR5
  - e. TLR9
5. Which of the following toll-like receptors is NOT found on the cell surface?
  - a. TLR2
  - b. TLR3
  - c. TLR5
  - d. TLR6
  - e. TLR11
6. During Mycobacterial infection in cattle, which of the following cytokines antagonizes the actions of TNF- $\alpha$  and IL-1 $\beta$ , thus potentiating the growth of the Mycobacteria?
  - a. IL-1 $\alpha$
  - b. IL-6
  - c. IL-10
  - d. IL-12

- e. IFN- $\gamma$
7. In which of the following tissues is COX-2 NOT constitutively expressed?
- a. Placenta
  - b. Cerebrum
  - c. Cerebellum
  - d. Heart
  - e. Kidney
8. Which statement is FALSE regarding prostaglandins?
- a. High concentrations of PGE<sub>2</sub> inhibit platelet aggregation
  - b. Low concentrations of PGE<sub>2</sub> potentiate activation of platelets
  - c. PGE<sub>2</sub> is related to myocardial hypertrophy
  - d. PGE<sub>2</sub> is important during ischemic reperfusion
  - e. COX-2 inhibition reduces PGI<sub>2</sub> and TXA<sub>2</sub> levels
9. All of the following growth factors signal through receptors with intrinsic tyrosine kinase activity EXCEPT \_\_\_\_.
- a. VEGF-A
  - b. IGF-1
  - c. FGF7
  - d. TGF $\alpha$
  - e. BMP
10. Which of the following is NOT expressed by stem cells?
- a. Oct-4
  - b. CD133
  - c. Connexin (GJIC)
  - d. CD44
  - e. CD99
11. Which of the following transporter molecules is responsible for the majority of calcium absorption in the renal tubules?
- a. NaPi-IIa
  - b. NaPi-IIb
  - c. NaPi-IIc
  - d. FBF-23
  - e. PHEX
12. Which of the following inflammatory mediators is NOT inhibited by surfactant protein D (SP-D)?
- a. IL-1
  - b. IL-6
  - c. TNF- $\alpha$
  - d. IL-2
  - e. Nitrous oxide (NO)
13. Which protein is primarily responsible for the calorie restriction effects on longevity?
- a. Annexin-V
  - b. Calreticulin
  - c. Beclin-1

- d. Sirtuins
  - e. Granzymes
14. Collagenases (MMPs1-3) are activated by which of the following?
- a. Thrombin
  - b. Plasmin
  - c. Plasminogen
  - d. Thrombomodulin
  - e. Caspases
15. Which factor is most commonly affected in hereditary coagulopathy of cattle?
- a. X
  - b. VIII
  - c. IX
  - d. XI
  - e. vWf
16. Which of the following prevents differentiation of stem cells?
- a. NANOG
  - b. EGG9
  - c. RTP-1
  - d. Sirtuins
  - e. Beclin-1
17. What is the primary metabolite produced by the activity of myeloperoxidase on hydrogen peroxide?
- a. Superoxide
  - b. Peroxynitrite
  - c. Catalase
  - d. Water
  - e. Hypochlorous acid
18. Which of the following is an endothelial derived PROCoagulant?
- a. Protein S
  - b. Thrombomodulin
  - c. Fibrinogen
  - d. PAI-1
  - e. Thrombospondin
19. Which of the following is NOT a constituent of platelet dense granules?
- a. Serotonin
  - b. Histamine
  - c. Platelet factor 4
  - d. Epinephrine
  - e. Magnesium
20. Which of the following adult cell types is “quiescent” with respect to proliferative activity?
- a. Neurons
  - b. Transitional urothelium

- c. Cardiac myocytes
  - d. Skeletal muscle myocytes
  - e. Smooth muscle cells
21. Active TGF $\beta$  is released from latent TGF $\beta$  by activation with \_\_\_\_.
- a. Thrombospondin
  - b. Thrombomodulin
  - c.  $\beta$ -thromboglobulin
  - d. Antithrombin
  - e. Thromboxane A2
22. The major VEGF receptor involved in lymphangiogenesis is \_\_\_\_.
- a. Flt-1
  - b. Flt-3
  - c. Flt-4
  - d. Flk-1
  - e. Flk-2
23. Which of the following regulates cycling of RAS between its inactive and active forms in growth factor receptor signaling?
- a. MEK
  - b. GRB2
  - c. GAP
  - d. SOS
  - e. RAF
24. Sox9 is critical for the differentiation of pluripotent bone marrow stromal cells into \_\_\_\_.
- a. Myotubes
  - b. Adipocytes
  - c. Osteoblasts
  - d. Chondroblasts
  - e. Endothelial cells
25. In dogs, leukocyte adhesion deficiency is attributed to defects in the gene encoding \_\_\_\_.
- a. E-selectin
  - b. L-selectin
  - c. CD11
  - d. CD18
  - e. Laminin-5 receptor
26. In phagocytosis, soluble *N*-ethylmaleimide-sensitive factor attachment protein receptors mediate \_\_\_\_.
- a. Opsonin receptor binding
  - b. Actin assembly and formation of filopodia for engulfment
  - c. Fusion of the phagosome and lysosome
  - d. Acidification of the phagolysosome
  - e. Oxidative burst
27. Which of the following bacterial virulence determinates detaches mucosal epithelial cells from their basement membranes by degrading sialic acid?
- a. Hyaluronidase
  - b. Neuraminidase
  - c. Phospholipase
  - d. Collagenase
  - e. Lecithinase

28. Fibroblasts produce all of the following matrix metalloproteinases EXCEPT \_\_\_\_.
- MMP-1
  - MMP-2
  - MMP-9
  - MMP-11
  - MMP-14
29. Which method of bacterial gene transfer involves uptake, by viable bacteria, of chromosomal DNA found free in extracellular fluid from dead bacteria?
- Transduction
  - Transformation
  - Conjugation
  - Vertical transfer
  - None of the above
30. Pre-miRNA is \_\_\_\_.
- The primary transcript of the miRNA gene
  - Cleaved by Drosha in the nucleus
  - Cleaved by Dicer in the nucleus
  - Exported intact from the nucleus by Exportin-5
  - A cofactor in the RISC
31. In maintenance of the genome, p53 “senses” DNA damage via what key initiator?
- ATR
  - BCL-2
  - GADD45
  - MDMX
  - p21
32. All of the following are outcomes of p53 activation EXCEPT \_\_\_\_.
- Increased p21 activity
  - Decreased VEGF activity
  - Increased BBC3 activity
  - Decreased TSP-1 activity
  - Transcription and processing of mir-34
33. A mutation which results in the substitution of one nucleotide base for another is a \_\_\_\_ mutation.
- Frameshift
  - Nonsense
  - Missense
  - Silent
  - Point
34. Which mechanism of loss of heterozygosity results in aneuploidy?
- Anaphase lag
  - Interstitial deletion
  - Gene conversion
  - Translocation
  - Mitotic recombination
35. Cytokines signal through the \_\_\_\_ pathway.
- IP3
  - PI3 kinase
  - MAP kinase

- d. cAMP
  - e. JAK/STAT
36. Signaling through the PI3K/AKT pathway results in a net \_\_\_ in mTOR, and thus a net \_\_\_ in protein translation and a net \_\_\_ of autophagy.
- a. Increase; increase; inhibition
  - b. Decrease; decrease; promotion
  - c. Increase; decrease; inhibition
  - d. Decrease; increase; promotion
  - e. Increase; increase; promotion
37. Phosphorylation of RB results in \_\_\_.
- a. Transcription of cyclin D
  - b. Transcription of cyclin E
  - c. Progression through the G2-M checkpoint
  - d. Enhanced binding with E2F
  - e. Recruitment of histone deacetylases
38. Which of the following inhibits MDM2?
- a. P14
  - b. P16
  - c. P21
  - d. P27
  - e. P57
39.  $\beta$ -catenin complexes with \_\_\_ to increase transcription of c-MYC and cyclin D1.
- a. Snail
  - b. Axin
  - c. APC
  - d. TCF
  - e. Wnt
40. The arthus reaction is a type \_\_\_ hypersensitivity reaction.
- a. I
  - b. II
  - c. III
  - d. IV
  - e. None of the above
41. Where do superantigens bind?
- a.  $V\beta$  chain of the TCR and  $\alpha$  chain of class I MHC molecule
  - b.  $V\alpha$  chain of the TCR and  $\beta$  chain of class I MHC molecule
  - c.  $V\beta$  chain of the TCR and  $\alpha$  chain of class II MHC molecule
  - d.  $V\alpha$  chain of the TCR and  $\beta$  chain of class II MHC molecule
  - e.  $V\alpha$  chain of the TCR and  $\alpha$  chain of class II MHC molecule
42. The transcription factor AIRE stimulates presentation of self-antigen during the development of \_\_\_.
- a. Central T cell tolerance
  - b. Peripheral T cell tolerance
  - c. Central B cell tolerance
  - d. Peripheral B cell tolerance
  - e. Activation-induced cell death
43. In the B cell antigen receptor, signal 2 is generated when \_\_\_ binds its ligand.
- a. CD40

- b. CD21
  - c. C3b
  - d. IgM
  - e. CD79a
44. Expression of FoxP3 promotes differentiation of lymphocytes toward \_\_\_\_.
- a. Th1
  - b. Th2
  - c. Th17
  - d. Treg
  - e. None of the above
45. Which of the following regulates complement by specifically inhibiting the MAC?
- a. C1-INH
  - b. CD59
  - c. MCP
  - d. CR1
  - e. DAF
46. Which of the following is a  $\beta$ 1 integrin expressed by nonactivated lymphocytes and monocytes to bind VCAM-1 in HEVs?
- a. LFA-1
  - b. Mac-1
  - c. VLA4
  - d. gp150,95
  - e.  $\alpha$ d $\beta$ 2
47. In dogs, Glanzmann thrombasthenia results from a deficiency in \_\_\_\_, which normally binds \_\_\_\_.
- a. Gp1b; vWF
  - b. Gp1b; fibrinogen
  - c. Gp1b; fibrin
  - d. GpIIb-IIIa; vWF
  - e. GpIIb-IIIa; fibrinogen
48. All of the following REQUIRE thrombin for their activation except factor \_\_\_\_.
- a. I
  - b. V
  - c. VIII
  - d. XI
  - e. XIII
49. All of the following are cytosolic antioxidants EXCEPT \_\_\_\_.
- a. Glutathione peroxidase
  - b. Superoxide dismutase
  - c. Ceruloplasmin
  - d. Lactoferrin
  - e. Catalase
50. All of the following are antiapoptotic Bcl-2 family regulators EXCEPT \_\_\_\_.
- a. BOO/DIVA
  - b. Mcl-1
  - c. Bcl-x
  - d. Bmf
  - e. A1